



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,032	04/02/2007	Paul Christopher Freeman	03164.0200USWO	9919
23552 7590 04/01/2009 MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			EXAMINER STALDER, MELISSA A	
			ART UNIT 1793	PAPER NUMBER
			MAIL DATE 04/01/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,032	Applicant(s) FREEMAN ET AL.	
	Examiner MELISSA STALDER	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 47-90 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 47-90 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 70 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 70 recites the limitation "the vessel" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 47 is rejected under 35 U.S.C. 102(b) as being anticipated by Schaufelberger (US 2,695,843). Schaufelberger teaches the precipitation of zinc from leach liquor where the ore is dissolved in an ammonium carbonate solution which will inherently form an amine complex with the soluble metals (col. 1, lines 15-42). The undesirable metals such as lead (gangue) will precipitate out (col. 2, lines 41-53). The removal of the carbon dioxide and ammonia causes the zinc to precipitate and then the collected solids are washed (col. 3, lines 24-55).

Art Unit: 1793

Claim 47 is rejected under 35 U.S.C. 102(b) as being anticipated by Mitchell (US 1,943,334). Mitchell teaches leaching ore such as sphalerite with ammonium carbonate to separate zinc oxide from crystals of sulfate. Mitchell teaches precipitation of zinc oxide and release of ammonia and carbon dioxide. Mitchell teaches removal of gangue and the presence of copper in the solution.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 47 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaufelberger (US 2,695,843) in view of Montgomery (US 2,961,295). Montgomery teaches the precipitation of zinc compounds which are dissolved in a leach solution of ammonium carbonate (col. 1, lines 15-22). Montgomery also teaches the removal of ammonia and carbon dioxide so that the zinc is precipitated and distilled to obtain a purer zinc compound (col. 2, line 40-col. 3, line 37). Montgomery does not explicitly teach gangue removal. Schaufelberger teaches removal of lead prior to precipitation of zinc and lead is not soluble under these circumstances so will precipitate out first (col. 2, lines 41-53). This is the equivalent of gangue removal. It would have been obvious to

Art Unit: 1793

remove gangue from an ore at this stage of a purification process as taught in Montgomery because the desired product, zinc, will be free of other metals and impurities. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Schaufelberger with the process of Montgomery because Schaufelberger teaches that if the zinc and the copper are to be pure and the copper electrolytic-grade, then the lead which is inherently not soluble in the first stage, should be removed.

Regarding claim 69, as Schaufelberger and Montgomery teach the process of zinc separation using the steps in claim 69, the apparatus as claimed would be obvious. Schaufelberger and Montgomery teach two consecutive stages and separation steps. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use these steps in an ore processing plant.

Claims 48-53, 61-64, 70-71, 72, 73, 75, and 83-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaufelberger (US 2,695,843) in view of Montgomery (US 2,961,295) as applied to claim 47 above, and further in view of Spink (US 5,028,410). Spink teaches a concentrate of a zinc sulphide in an ammoniacal ammonium carbonate solution where the solution is close to 50 degrees C and the pH is about 11. The pH and temperature are essentially the same as those claimed or the claimed pH and temperature could be arrived at using normal experimentation by one skilled in the art at the time of the invention. Further, it would have been obvious to one of ordinary skill in the art at the time

Art Unit: 1793

of the invention to combine the teachings of Spink with the process of Schaufelberger and Montgomery because Spink teaches that these conditions produce a high surface area zinc oxide from the concentrate (col. 2, lines 14-22).

Regarding claims 50, 52, 72 and 74 Schaufelberger teaches the use of the appropriate amount of copper in the solution, which can include the addition of copper to facilitate the reaction (col. 3, lines 40-47).

Regarding claim 51 and 73, Schaufelberger teaches oxidation of the copper and recycling the cupric copper (col. 4, lines 31-47).

Regarding claims 53 and 75, Schaufelberger teaches that the maximum amount of copper should be 200 g/L (col. 2, lines 16-18).

Regarding claims 61 and 83, Spink teaches a pH above 11 and does not teach an adjustment of the pH to a more basic pH. Therefore, it can be assumed that the pH remains above 6.8. Further, Spink teaches that sulphur is an impurity and therefore should not be precipitated with these metals.

Regarding claims 62 and 84, Montgomery teaches the precipitation of zinc and evaporation of ammonia (col. 4, lines 9-17). The stoichiometry of the reaction would be inherent in this reaction with the same reactants and products.

Regarding claims 63, 64, 85, and 86, Spink teaches calcining after separation where the calcining is conducted between 400 and 600 degrees Celsius (col. 2, lines 57-68).

Claim 54-56, 59, 76-78, 81, 82 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaufelberger (US 2,695,843) in view

Art Unit: 1793

of Montgomery (US 2,961,295) in view of Spink (US 5,028,410) as applied to claims 48-53 above, and further in view of Mitchell (US 1,943,334). Mitchell teaches the use of sphalerite in a metallurgical process. It would have been obvious to one of ordinary skill in the art at the time of the invention to use sphalerite in the process of Schaufelberger, Montgomery, and Spink because Mitchell teaches that zinc commonly occurs in a sulfide form and that the ore may be used to obtain zinc oxide through a leaching process (col. 1, lines 4-17). Further, Montgomery teaches the zinc and copper reactions and it would have been obvious to one of ordinary skill in the art to adjust the stoichiometry of the reactions for the presence of ZnS as taught in Mitchell. Also, Schaufelberger teaches that it would be known in the art to adjust the amount of copper and the reaction so that the copper does not precipitate and remains cuprous (col. 3, lines 24-48).

Regarding claim 56, Schaufelberger teaches oxidation of the copper and recycling the cupric copper (col. 4, lines 31-47).

Regarding claims 59 and 81, Mitchell teaches blowing hot air or boiling the solution to release ammonia and precipitate zinc (pg. 4, lines 84-91).

Regarding claims 60, 82 and 90, Spink teaches a steam stripping step (col. 2, lines 57-59).

Claims 57-58, 65-68, 79-80 and 87-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaufelberger (US 2,695,843) in view of Montgomery (US 2,961,295) in view of Spink (US 5,028,410) as applied to

Art Unit: 1793

claims 48-53 above, and further in view of Kuhn (US 3,954,450). Kuhn teaches the addition of recirculating oxygen gas in the solution that has dissolved the ZnS at a temperature of 60 to 90 degrees C and a pH from 9 to 11. It would have been obvious to one of ordinary skill in the art at the time of the invention to add the oxygen of Kuhn with the process of Schaufelberger, Montgomery, and Spink because Kuhn teaches that this is the most efficient and quickest way to achieve high oxidation (col. 4, lines 1-20).

Regarding claims 65-68 and 87-89, Kuhn teaches filtration which would lead to the production of a salt. Kuhn teaches the addition of lime (a neutralizing agent) in order to adjust the pH to between 6 and 10 during the separation stage. Kuhn teaches heating to remove the ammonia (col. 5, lines 3-22; col. 3, lines 31-58).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MELISSA STALDER whose telephone number is (571)270-5832. The examiner can normally be reached on Monday-Friday, 8:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MS
03-19-09

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793